



Retractor - ALR Durability

1 Introduction

Note: Nothing in this standard supercedes applicable laws and regulations.

Note: In the event of conflict between the English and domestic language, the English language shall take precedence.

1.1 Purpose. The purpose of this procedure is to be used to evaluate the life cycle of an Automatic Locking Safety Belt Retractor (ALR).

1.2 Applicability. To determine the minimum angle of retractor rotation and the level of accelerations required to lock-up a vehicle/webbing sensitive retractor.

1.3 Remarks. Retractor assemblies being tested beyond the one life are subjected to dust exposure and environmental conditioning prior only to the first life.

2 References

Note: Only the latest approved standards are applicable unless otherwise specified.

2.1 External Standards/Specifications.

None

2.2 GM Standards/Specifications.

GMW14831

2.3 Additional References.

- American National Standard for Calibration, Calibration Laboratories and Measuring and Test Equipment – General Requirements
- GM Math File Log

3 Resources

3.1 Facilities. General Motors certified test lab.

3.1.1 Calibration. The test facilities and equipment shall be in good working order and shall have a valid calibration label.

3.1.2 Alternatives. Alternative test facilities and equipment may also be used. However, all measuring variables as specified in this standard shall be determined correctly with respect to their physical definition.

3.2 Equipment. The following equipment or equivalent is required.

3.2.1 Safety belt assemblies to be tested.

3.2.2 Torque wrench with a 70 Nm capability.

3.2.3 Automatic locking safety belt retractor cycle machine.

Note: All equipment must be calibrated in accordance with American National Standard for Calibration, Calibration Laboratories and Measuring and Test Equipment – General Requirements.

3.3 Test Vehicle/Test Piece. Not applicable.

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3.4 Test Time.

Calendar time: 8 days
Test hours: 192 hours
Coordination hours: As applicable

3.5 Test Required Information. Not applicable.

3.6 Personnel/Skills. Not applicable.

4 Procedure

4.1 Preparation. See GMW14831. Common conditioning sequence.

4.2 Conditions. See GMW14831.

4.2.1 Environmental Conditions. Not applicable.

4.2.2 Test Conditions. Deviations from the requirements of this standard shall have been agreed upon. Such requirements shall be specified on component drawings, test certificates, reports, etc. Deviations from the requirements of this standard shall be approved by GM engineering and documented in the GM Math File Log.

4.3 Instructions.

4.3.1 Mount the retractors to the cycle machine (using the specified bolt installation torque) and adjust the blocks to position the retractors such that the webbing is extended and retracted with minimum interference between the webbing and the retractor opening.

4.3.2 Adjust the upper limit sensor to fully extend the webbing and apply the specified tension of 90 N at full extension.

4.3.3 Adjust the lower limit sensor to indicate full retraction per vehicle installation (refer to the GMW14831 "ALR Mechanism Range of Engagement").

4.3.4 Position the "safety-block" to protect the retractors in the event the lower limit sensor malfunctions.

4.3.5 Adjust the mid-travel limit sensor to check for lock-up and apply the specified tension of 90 N at a point between 50% and 100% extension.

4.3.6 Attach the latch plate or the webbing end to the extraction/retraction head of the machine.

4.3.7 Pre-set the machine counter (if available) to the number of cycles specified.

4.3.8 Operate the retractor cycle machine at a rate of approximately 6 cycles per minute to 10 cycles per minute (for a retractor with 2100 mm stowed, the webbing extract/retract rate should not exceed 600 mm/s) as follows:

A cycle shall consist of a complete extension, partial retraction, a check for lock and complete retraction. Full extension and the check for lock must be loaded to 90 N. The cycling equipment must individually monitor each retractor's performance and be capable of recording the failure mode and cycle count.

5 Data

5.1 Calculations. Not applicable.

5.2 Interpretation of Results. Not applicable.

5.3 Test Documentation. Not applicable.

6 Safety

This standard may involve hazardous materials, operations, and equipment. This standard does not propose to address all the safety problems associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

7 Notes

7.1 Glossary. Not applicable.

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